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Focus. . .Suicide Attempts and Suicide Fatalities

Each year in Missouri more people are killed by their own hands than are killed by other people. Yet deaths are just the tip of the iceberg of self-inflicted injuries. A Missouri law mandating the collection of hospital inpatient and outpatient records affords the opportunity to compare suicide deaths to patients who have inflicted nonfatal injuries on themselves.[1] As this study shows, besides being a much larger group, the nonfatal suicide attempts appear to be a different population.

Impact of Suicides

A total of 710 Missourians killed themselves in 1997, making suicide the eighth leading cause of death. Among 25-34 year olds, suicide was the second leading cause. It was the third leading cause for 5-14 year olds and 15-24 year olds, and the fourth leading cause for 35-44 year olds. A survey by the Centers for Disease Control and prevention (CDC) found that 27 percent of 11,000 U.S. high-school students surveyed "thought seriously" about killing themselves during the previous year. Eight percent of the students reported making at least one attempt (1).

The number of deaths from suicide each year is far outweighed by the number of outpatient visits and admissions for self-inflicted injuries. In 1997 there were 6758 hospital records for such injuries, nearly 10 times the number of suicide deaths. This is above the national estimate of 8 attempts for every completed suicide (2). By age group, the ratio of hospital records to records for suicides was highest for children under age 15; they had 52 hospital records (combined outpatient and inpatient) for every completed suicide. The lowest ratio was for those aged 65 and over, who had about the same number of hospital records as completed suicides.

In 1996, the Missouri age-adjusted death rate for suicide was 13.3 per 100,000 population. This was 23 percent higher than the age-adjusted U.S rate of 10.8 (3). Missouri's rate was higher particularly among those aged 15-24 and 25-44. For 15-24 year olds, the Missouri rate was 16.0, while the U.S. rate was 12.1. For 25-44 year olds, the Missouri rate was 18.9, the U.S rate 15.0. Missouri's elevated suicide risk is not a one-year aberration. Its suicide rate has been higher than the national rate at least as far back as 1990.

Trends

During the period 1990-1997, Missouri recorded a total of 5,709 suicides, or an annual average of 12.6 per 100,000 persons in the population. The rate was lowest in 1992, when it was 11.5. Four years later, in 1996, it reached a high of 13.3. Since then it has dropped to 12.1 in 1997.

According to hospital records, treatment of Missourians for self-inflicted injuries increased slightly from a rate of 130 to 138 per 100,000 population during 1994-1997. All of this increase was accounted for by outpatient treatments, which increased 20 percent from 69 to 83 per 100,000 population. Inpatient rates dropped 10 percent during this period (Figure 1).

Race, Gender and Age

During 1997, blacks visited hospitals for self-inflicted injuries at a rate that was 12 percent higher than that for whites: 137 per 100,000 population vs. 122. In contrast, the death rate for suicides was almost two times higher for whites than for blacks: 14.1 vs. 7.4.

Females were nearly 50% more likely than males to be hospitalized or visit an emergency room for a self-inflicted injury. In 1997, females had a rate of 165, males a rate of 111. The rate for self-injury was highest among 15-24 year olds for both genders. Among females, the rate for this age group reached 352 (Figure 2). Males had a considerably lower rate at 219.

Males were much more likely to die of suicide. In 1997, for example, males had a suicide rate of 21.6 per 100,000. This was nearly five times the female rate of 4.2. Males aged 65 and over had the highest suicide rate at 41.4 (Figure 3). Among females the rate reached a high of 6.7 in 25-44 year olds. During the entire period of 1990-1997, however, females aged 45-64 had a very slightly higher suicide rate than those aged 25-44-6.6 vs. 6.5.

Youth suicides are a matter of great concern. As might be expected, though, children have the lowest suicide rate. Those under age 15 had a rate of 0.8, or slightly less than one suicide per every 100,000 children. From there the rate jumped sharply to 10.9 for 15-19-year olds.

The proportion of suicides that are males reflect their high rates. In 1997, males made up 83% of the 710 suicides. Females, on the other hand, accounted for more of the hospital records-59 percent in 1997.

Method

The most often used methods for inflicting fatal and nonfatal injuries on oneself were the same across the gender, race and age groups. Hospital records show that poisoning was the most frequently used method for inflicting nonfatal injuries. Overall, poisoning accounted for an astonishing 82 percent of the 6758 hospital records for self-injury in 1997. This left the next most frequent methods to make up a much smaller percent. Falls (jumping from high places) had a rate of 10 percent, firearms, 2 percent and suffocation, 1 percent.

The most frequent cause of suicide deaths was firearms. In 1997 they were used in 65 percent of the suicides. Firearms were used most often by 15-24 year olds and those aged 65 and over. Their rates were 79 percent and 70 percent, respectively. After firearms, poisoning was the next most frequently used method of killing oneself (18 percent), followed by suffocation and strangulation (13 percent).

When the outpatient, inpatient and death records are considered together, firearms are seen to be the most lethal method of injuring oneself. Seventy-eight percent of the firearm records are for deaths, whereas only 22 percent are for hospital inpatients or outpatients. Hangings and strangulations are the next most lethal, with 63 percent of the records being for deaths and 37 percent for hospital patients. Only 1 percent of the fall/jump records and 2 percent of the poisoning records are for deaths.

The lethality of firearms relates to the high fatality rates of males and whites. In 1997 there were 588 records for firearm-related suicide attempts and deaths. Males accounted for 87 percent and whites 93 percent of these records. Conversely, for the much less lethal poisonings, males accounted for only 36 percent and whites for only 85 percent.

Location

For the 1987-1997 period, there were six rural counties that had age-adjusted suicide rates that were both significantly higher than the state rate and among the quintile of counties that had the highest rate. These were Mercer, Monroe and St Francois, and three counties in the Kaysinger Basin Regional Planning Commission (RPC) area-Bates, St. Clair and Benton. The Kaysinger Basin RPC also had the highest suicide rate according to a study of suicides that occurred during 1987-1991 (4).

In order to identify the factors associated with the high suicide rate in the Kaysinger Basin three-county (KB-3) area, these counties were compared to the rural counties that fell into the lowest quintile of suicides. There were 16 such counties, including Adair, Atchison, Caldwell, Gentry, Holt, Knox, Madison, Ozark, Phelps, Schuyler, Scotland, Shannon, Stone, Warren, Washington and Worth.

Comparison of the KB-3 with the lowest 16 counties suggested there might be a higher use of firearms in the KB-3 area, particularly among the females. However, the small number of cases involved prevented either of the differences from reaching statistical significance. Firearms were used in 83 percent of KB-3 suicides during 1987-1997, compared to 77 percent in the lowest-16. Eleven of the 12 KB-3 females, or 92 percent, used firearms to kill themselves, compared to 21 out of 32, or 79 percent, of the lowest-16 females.

Alcohol involvement was much more prevalent among KB-3 county suicides than among the lowest-16. At 34 percent of the suicides, KB-3 alcohol involvement was nearly twice that of the 19 percent rate in the lowest-16. There were a large number of cases for which alcohol use was unknown, however, and the differences in the two areas were not statistically significant.

KB-3 counties had a higher ($p<.05$) rate of suicides among 55-64 year olds (11-year average of 29.5/100,100 population vs. 8.9) and 25-34 year olds (44.9 vs. 8.3). Males accounted for a similar proportion of suicides in the two areas, with 88 percent in the KB-3 area and 86 percent in the lowest-16.

Summary

The rate of suicide deaths has been relatively stable in Missouri from 1990-1997, while the rate of people receiving outpatient treatment for self-inflicted injuries has increased by 20 percent between 1994 and 1997. Missouri's suicide rate exceeded the nation's during this period. Blacks had about half the suicide rate of whites, but were 12 percent more likely to visit the hospital for self-inflicted injuries. Females accounted for about 60 percent of the hospital records for self-injury, but males accounted for 83 percent of suicide deaths. Those aged 25-44 had the highest risk of being treated for self-inflicted injury, but the elderly had a higher rate of suicide deaths. Hospital outpatient and inpatient records indicated an overwhelming use of poison (82 percent of records), whereas completed suicides were most often the result of firearm use (65 percent). High suicide rates in three counties in the Kaysinger Basin RPC indicate a continuing problem with suicides and probable alcohol involvement. In general, differences between hospital patients and completed suicides point to different populations with possibly different motivations for injuring themselves.

The factors associated with self-injury and suicide in Missouri can only begin to suggest promising areas for intervention. Identification of risk factors may or may not lead to successful prevention programs. The list of risk factors identified by the many studies in this area is very long (5), but the list of interventions with proven ability to reduce suicides is very short (6). A major problem is that suicides are relatively rare. Thus programs must be long term and address either a very large or very high-risk population in order to show statistically reliable results. Additionally, this study suggests that fatal and nonfatal self-injuries have different risk factors, and intervening with the more numerous nonfatal group may not significantly reduce the fatal suicides.

Footnotes:

1An injured person may be hospitalized or receive outpatient treatment more than once, so the number of individuals represented by the hospital records is somewhat less than the number of records. Unless stated otherwise, the hospital rates in this report are for the combined inpatient and outpatient records. Inpatient records represent fatal and nonfatal suicides, but fatalities account for only 1 percent of the combined inpatient and outpatient records. All rates in this paper are per 100,000 population.

References:

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Provisional Vital Statistics for December 1998

The **Live births** increased in December as 7,470 babies were born compared with 6,903 one year earlier.

Cumulative births for the 12 months ending with December of 7,652 is the highest such count since 1992.

Deaths decreased in December as 4,325 Missourians died compared with 5,110 one year earlier. Cumulative deaths for January-December 1998 of 54,838 (a record) represents a 1.2 percent increase over 1997.

The **Natural increase** in December was 3,145 (7,470 births minus 4,325 deaths). The natural increase for January-December was 20,814, the highest count in five years.

Marriages increased in December as 2,951 Missouri couples married compared with 2,725 in December 1997. Cumulative marriages for 1998 are virtually the same as in 1997, 43,795.

Dissolutions of marriage decreased in December, but show a slight increase for the cumulative 12 months ending with December.

Infant deaths increased in December as for the cumulative 12 months ending with December. The infant death rate for January-December was 7.9 per 1,000 live births compared with 7.6 in 1997.

PROVISIONAL RESIDENT VITAL STATISTICS FOR THE STATE OF MISSOURI

	December				12 months ending with December								
Item	Number		Rate*		Number				Rate*				
	1997	1998	1997	1998	1995	1996	1997	1998	1994	1995	1996	1997	1998
Live Births	6,903	7,470	15.0	16.2	72,804	73,733	73,940	75,652	14.5	14.3	14.3	13.7	13.9
Deaths	5,110	4,325	11.1	9.4	54,222	53,766	54,203	54,838	14.0	10.1	10.0	10.0	10.1
Natural increase	1,793	3,145	3.9	6.8	18,582	19,967	19,737	20,814	4.1	3.7	3.7	3.6	3.8
Marriages	2,725	2,951	5.9	6.4	45,057	44,473	43,812	43,795	8.5	8.5	8.3	8.1	8.1
Dissolutions	2,334	2,110	5.1	4.6	25,726	25,438	25,632	25,799	5.1	5.0	4.8	4.7	4.7
Infant deaths	43	50	6.2	6.7	539	558	562	597	8.4	8.1	7.6	7.6	7.9
Population base (in thousands)	...	...	5,364	5,408	...	...	...	...	5,281	5,325	5,364	5,408	5,439

*Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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